GAS JOURNAL, FEB. 11, 1942

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EDITORIAL NOTES

LIAISON OFFICERS

AN announcement elsewhere in this issue of the appointment of Liaison Officers by the Director-General of Gas Supply, under authority of the President of the Board of Trade, will be read with interest by all gas executives, and perhaps with speculation in those areas where such an officer has not yet begun to function. By the courtesy of the Director-General himself, we have been able, by direct question and answer, to satisfy our own curiosity in greater detail as to the functions which these Liaison Officers will carry out. If the main one mentioned in the necessarily bare official notice—*viz.*, "to keep the Directorate informed of the position of all gas undertakings"—has a slightly ominous sound with just a hint of added bureaucracy about it, we can give our assurance that exactly the opposite is likely to be the case. Only two imaginable eventualities would mar a scheme devised with the one object of lubricating the working of the Industry. One would be the appointment of the wrong men for the job, and the infinite care which is being devoted to their selection should obviate this. The other would be a purely obstructionist attitude on the part of gas undertakings, which is unthinkable given the right Liaison Officers and a full understanding of the fact that they are there to help and not to hinder, carrying Board of Trade authority to expedite action and help to smooth away difficulties, but no executive powers of interference or compulsion.

The official announcement mentions appointments so far in only three Regions, but the scheme will be extended to cover the remainder as rapidly as possible, the sole limiting factor being the absolute necessity of finding men not only of the right qualifications, but also of the right type. What manner of men are we, then, to expect? An examination of the antecedents of those already named shows them to have only one really outstanding characteristic in common—none of them is a "Gas Industry" man. Whether or no this is to be the one qualification which, whatever else, is essential, we are not certain. We believe, however, that it is one which would be readily accepted by the Industry itself as conducive to the smooth working of the whole scheme, and a further step towards shaking off the parochialism which has so hampered our development in the past, and still threatens to clog our progress in spite of much lip service paid to the need for a wider outlook. The three Officers already selected have seen service at home and overseas, in coke oven practice, oil, general engineering, and many other spheres. They are already proving acceptable to the gas engineers with whom they are in contact, and we have no fear that other appointments to come will be less wisely made.

This being so, as soon as gas undertakings use their Liaison Officer as it is intended he shall be used, many of their wartime worries should be eased, even if they do not completely vanish. Who, for instance, has not had good reason to grumble heartily at the trouble and duplication caused by the demands for information by the Production Departments? Who has not longed, at times, for an authoritative interpretation of some instruction or other which the official language of one of the Departments has made anything but clear? Who has not wondered exactly what he should do to obtain desperately needed steel or labour in a hurry; puzzled his brain as to the most hopeful approach to somebody who might have something to give; or despairingly sought, amid the ever-changing scene, the precise meaning at any given moment of a priority? These are some of the conundrums which the Liaison Officers—armed, be it remembered, with Board of Trade authority and direct access to those who *can* interpret official instructions, and free of the cares of making gas and administering an undertaking—will be able to solve. They are, however, only a few examples which readily come to mind. We believe the average gas engineer will soon find that he has a most valuable ally in innumerable directions, and incidentally the Liaison Officer may quite likely discover that there are more posers in gas-works wartime administration than were dreamed of in anybody's philosophy.

BASIC REBUILDING

IT is certain, however, that the Directorate of Gas Supply will regard such posers as the more the merrier, since its conception of its duties is to assist the Gas Industry to reorganize itself, to a revolutionary degree if necessary, to serve the best interests of the nation to-day and in the future. It must be confessed that, up to the present, the most hopeful reaction to such an idea has appeared from the base, rather than the apex, of the Industry. The components of the base, as we suggested recently, are becoming increasingly restive at the apparent lack of action or lead from above, or, if action is maturing however slowly, at the secrecy with which it is hedged about, affording small opportunity for expression by those who have views to put forward. We ventured last year, soon after Dr. E. W. Smith's appointment, to give our impression of the lines along which the Directorate would probably approach its problem, and nothing in the meantime has occurred to alter the opinion we then formed. In the coming re-organization, it is fundamentals which have first to be tackled, and, though complete gasification, calorific values, and even A.T.B. numbers may be part of the general picture, they become secondary considerations when the basic structure of the design is being envisaged. As a whole, then, the Industry must have its say, and it may well be that the Directorate will regard its appointment of Liaison Officers, in direct contact with every individual gas undertaking, as part of the process of building up strength from the bottom, as a means also of informing itself in the wider implications of Gas Industry reform, in addition to the day-to-day problems of wartime gas supply.

LABOUR

WE referred above in passing to Labour difficulties, with a hint that the new Liaison Officers might help in their solution. We believe we are right in forecasting good news for the Gas Industry in this direction and, without being in a position to give detailed information on the subject, we hope that reservation will be extended, subject to Board of Trade agreement in individual cases, to cover practically all men at all events on the production and distribution sides. We believe, too, that labour which may become surplus in any works or district will be made available to others who urgently require it, and in the formation and use of such a pool the new officers should prove invaluable. If such provisions are extended, as we think they may be, to the contracting side of the Industry, they will be doubly welcome. In general, any such concessions which the Board of Trade might succeed in winning for us would be not only of considerable material help, but might be taken, too, as an encouraging sign of official recognition of our needs which the Director-General can be trusted to hammer home on every occasion.

SAVING COAL

IN other columns we give an interesting note on gas economy, which naturally has been one of Mr. A. E. Sylvester's chief cares since his appointment as General Manager of the Gas Light and Coke Company. A saving of 300 tons of coal in one quarter is a very striking figure indeed applied only to the offices and showrooms of one gas undertaking, even if it is the largest in the world. As Mr. Sylvester explained to us himself, he has been able to effect such a saving by personally interesting members of the staff in the matter, by displaying graphs on which the comparative consumption curves are kept up to date daily, and by appointing "gas chasers" in each department to encourage fuel economy by every means consistent with the well-being of the staff.

Such an "economy-at-home" campaign strikes us as one of the few effective attempts we have seen to grapple with the tough problem of persuading the British public to accept some measure of discomfort, or at least to save where saving can be achieved by a little thought even without discomfort. This interesting Gas Light story suggested to us an enquiry of the Director-General as to the progress of his task of making gas available wherever it is required for the war effort. We wrote some time ago of some of the inefficient utilization among the big users which investigation had brought to light. It is encouraging to learn now that where shortages of gas have occurred they have most usually been of the order of 5 to 8%, and it is the studied opinion of the Directorate that in practically every gas undertaking which has large consumers there is ample scope to economize to this degree and more. Moreover, that such economy can be effected without recourse to drastic technical alterations of plant; that, in fact, thousands of therms a day are being used to heat nothing except the insides of empty furnaces or to make pretty pyrotechnic displays for nobody's benefit except the enemy's. This, then, will be an additional point for the attention of the Liaison Officers. The measure of authority which they will carry will be a valuable supplement to the efforts of the gas engineer who, after all, until recently has been on terms with the user of eager seller and critical buyer. In cases of need, the Liaison Officer will have the full co-operation of the well-developed Industrial Centres.

We are not suggesting, however, that any gas undertaking should sit down and await the arrival of his Liaison Officer. Those who have not yet hunted down every possibility of saving should do so without delay. Our country is more interested at the moment in coal economy than in individual increases in gas consumption as such.

INFRA-RED IN INDUSTRY

THE physiological effects of infra-red rays have for long been a special study of Radiation Ltd., the results of whose work in this field have been fully recorded in the "JOURNAL." As long ago as 1928—and this following years of research into the therapeutic properties of the radiant energy emitted by the gas fire—we saw the introduction of the "Beam" radiant embodying practically the virtues of short infra-red energy. Advances made by Radiation Ltd. since then have resulted in a greater emission of this short-wave energy and the development and introduction of the clinical gas lamp. Let us turn for a moment from domestic and therapeutic to industrial application, with reference to the speeding-up of production in munition factories.

In the current annual reports of the Council of the Gas Research Board, of the Chairmen's Technical Committee of the Institution, and of the Livesey Professor at Leeds University there is brief—very brief—mention of the work of the Arthur Duckham Research Fellow. We are told that a possible commercial application of one aspect of the work relates to the use of infra-red radiation in industrial drying processes, that the Yorkshire Industrial Gas Centre has been interested in this question, and that the Council of the Gas Research Board is in consultation with the Industrial Gas Centres Committee as to the general industrial application of infra-red radiation. We should, of course, like to hear a great deal more about this. In the meantime we have information on electrical equipment for infra-red radiation and its application to industrial processes. In a recent Paper to the Illuminating Engineering Society Mr. R. Maxted expressed the opinion that infra-red radiation can and must play an important part in speeding war production. Most wartime products require a protective finish, and synthetic enamels or lacquers are commonly applied. Such finishes can be baked in a few minutes with infra-red equipment as compared with an hour or more in the conventional convection oven. The material receiving heat treatment is not necessarily the absorbing substance. For example, an enamelled metal sheet may be irradiated from the back, or a transparent lacquer may be heated partly by absorption in the underlying substance. It would appear that the main value of radiant heating, as also the overall efficiency of the process, arises largely from reduction in process time. Effective absorption of energy means the release of heat at the most suitable point rather than a high utilization of the total energy provided. Judging from experience in the United States infra-red radiation has very wide application industrially. Mr. Maxted considers paint baking to be the most generally significant application in wartime. The successful development of the industrial application of infra-red radiation to industrial processes obviously calls for the close collaboration of the suppliers of the heat energy and chemists and metallurgists. As we have said, we look forward to further information on the application of gas in this direction to industrial drying and preheating.

Hours of Work and Labour Wastage

There has just been published as an emergency report the results of an investigation by the Industrial Health Research Board made in a number of munition factories during the period from the outbreak of war until the end of June, 1941 (H.M. Stationery Office, price 6d. net). The report deals with the question of hours of work and with some of the hindrances to maximum output, including lost time and labour wastage. It is shown that the time lost by factory workers through sickness, injury, and absence without permission, when undisturbed by extraneous factors, varied with the weekly hours of work. It was usually low when the hours of work were less than 60 per week, but increased as the hours increased to 75. The findings suggest that, over an extended period, the weekly hours of work should generally not exceed 60 to 65 for men and 55 to 60 for women. In all the groups the workers were stimulated to an increased output after the collapse of France, and although it was physiologically impossible to maintain the maximum level reached, output in nearly every case has since remained above the previous level. The beneficial effects of a reduction in excessive hours of work, together with the inauguration of staggered holidays, were reflected in an increase in the rate of working afterwards. Labour wastage varied considerably from one factory to another, some of the conditions leading to a high rate being the employment of women unaccustomed to factory work, or married women whose domestic responsibilities prevented satisfactory adjustment to factory life. The report shows that the problem of maximum production by the human being is not the simple proportion sum of "if one unit of work is done in one hour by one man then twelve units of work will be done by him in twelve hours." After a certain number of hours the best will in the world cannot keep up the pace. Emergency efforts can be crowned with amazing success, but, states the report, "unfortunately industry often fails to acknowledge the extraordinary effort as extraordinary and complains when the extraordinary gives place to the ordinary, or below ordinary."

The fact that goods made of raw materials in short supply owing to war conditions are advertised in the "Journal" should not be taken as an indication that they are necessarily available for export.

Personal

Stafford Town Council have appointed Mr. JOSEPH POULSON, Gas Engineer and General Manager at Oldbury, to the position of Gas Engineer and Manager for the Borough rendered vacant by the death of his brother, Mr. T. H. Poulson. Mr. Poulson, who is 46 years of age, is a native of Stafford, his father, the late Mr. Arthur Poulson, being Works Manager at the time the late Mr. W. M. Valon was Chief Engineer. Mr. Joseph Poulson served his articles at Stafford under Mr. Valon and went to Oldbury in 1924.

* * *

Mr. WILLIAM OLDHAM, Deputy Engineer and Manager to the Ilkeston Corporation Gas Department, has been appointed Engineer and General Manager to the Fleetwood Gas Company as from March 1 in succession to Mr. T. E. Parry, who, as reported in the "JOURNAL" for Jan. 21, goes to Cannock. In our notice of the latter appointment we much regret that we described Mr. Parry as having been Engineer and Manager of the Fleetwood Gas Department, whereas he has been Engineer and General Manager.

Obituary

We recorded in our issue last week the death of Mr. LOUIS THURNER, of Falk, Stadelmann & Co., Ltd. He was 73 years of age and had occupied the position of Managing Director for 29 years, having been appointed on the death of Mr. S. Falk (founder of the firm) in 1913. His connexion with the Company dates back to 1886. In the early days he identified himself almost wholly with the gas supplies section of the business, and under his wise guidance the Company extended generally its interests in the lighting, heating, and cooking industry.

Mr. Thurner visited many parts of the world on his firm's behalf, and he was responsible for establishing branches at Melbourne and Sydney, Australia, at Wellington, New Zealand, and Cape Town and Johannesburg, S. Africa. He took a deep interest in the welfare of his workpeople, and it was due to his solicitude that a staff pension fund was established some years ago.

Mr. Thurner leaves a wife, daughter, and a son, Capt. Walter Thurner, at present serving with H.M. Forces.

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Mr. ALONZA SMITH, who occupied the position of Works Foreman at the Darwen Gas-Works for over twenty years until his retirement on superannuation owing to ill-health in December, 1940, died at his home in Darwen on Jan. 28. A native of Nottingham, where he was employed at the Gas-Works, Mr. Smith also occupied positions in the Gas Industry at Hastings and St. Leonards, Merthyr Tydfil, Swadlincote, and Accrington. He was 60 years of age.

* * *

The death has taken place at the age of 55 of Mr. CHARLES FREDERICK TOOBY, who until his retirement owing to ill-health last spring was Deputy Engineer and Manager of the Coventry Gas Undertaking. Mr. Tooby joined the Birmingham Gas Department in 1905, and from 1913 to 1918 he was Superintendent of Saltley Gas-Works.

Letters to the Editor

Gas Storage Water Heater Design

DEAR SIR,—As one who has for many years been interested in the design of storage gas water heaters, I found the summary of the A.G.A. Bulletin No. 12 on the "Principles of Gas Storage Water Heater Design for Maximum Hot Water Delivery" published in your issue of Jan. 28 most interesting.

In section (c) reference is made to the separation of the flow and return connexions which gives results which are in accordance with the increase in circulating head. The summary, however, omits mention of the effect of the bore of the pipes and the travel/height factor. It is hoped that in the third report further considerations may include these and other factors, such as the velocity of water through the outlet from the dip tube and the form of storage vessel to be preferred.

The observations on the design and position of the cold water inlet or dip tube are most valuable and constructive, but I cannot agree with section (14), which states that "water pressure has no effect on the percentage of usable stored heat delivered." The expression "usable heat" is not defined, and it is possible that the intention is to refer to "usable hot water," which is defined as water at 120°F. or higher. If the velocity of the cold water from the outlet of the dip tube is sufficiently high it will be impossible to draw off anything like the total storage at the required temperature.

In this country we normally understand a tank to be a six-sided vessel of rectangular section, which in my experience does not lend itself to stratification when hot water is being drawn off, whatever the design or position of the dip tube may be. It is possible, however, that in the United States a cylindrical vessel or vessel of other non-rectangular form may be termed a tank, and that with such vessels it is not difficult to avoid turbulence and consequent mixing of cold water with the hot. It would be most interesting to have details of the conditions of test, possibly with diagrams, showing the arrangements for varying the factors involved in accordance with the conditions which are capable of application on the district.

9, Berkeley Court,
Neasden Lane,
London, N.W. 10.
Feb. 5, 1942.

Yours faithfully,
T. B. V. HIRST.

Automatic Cooker Ignition

DEAR SIR,—In the discussion on the Symposium "The Gas Industry: 1941 and After," Mr. R. J. Rogers (Author of "The Standardization of Consumers' Appliances as a Post-War Policy") included in his reply the statement, "With regard to automatic oven ignition, mentioned by Mr. Hill, it is appreciated that this would be a desirable feature to incorporate in the cooker of the future; much more work requires to be done, however, before this can be standardized."

I have devised an arrangement for automatic ignition on the hotplate which is also capable of application to the oven. I desire to place it on record now and hope it will be kept in mind when the time comes for the re-planning of appliances. I also submit that a portion of the arrangement could be adopted immediately with a view to saving both matches and gas. Since I fitted the arrangement to my own cooker some months ago we have hardly used any matches in our house.

The arrangement consists in a by-pass pilot light of exceptionally small size protected so that it cannot readily be blown out by draughts. When it is desired to light a burner ring or grill the full gas supply is turned on to the pilot light, which, now becoming a ray, strikes across the cooker top and lights whatever ring is turned on. For a cooker of ordinary household size—three boiling rings and a grill—I find that only one lighting ray is necessary provided it is in the correct position, and provided that the kettle or pan to be heated is put on the ring before lighting it. I know that something like this is in use, but my arrangement possesses certain new features which I consider to be of value:

(1) Low consumption of gas: The ordinary pilot light consumes ¼ cu.ft. per hour. Assuming the price of gas at 3s. per 1,000 cu.ft. this represents an annual increase in the gas bill of 6s. 7d. The protected pilot light consumes the fifth part of this and costs 1s. 4d. per annum in comparison.

(2) The lighting arrangement being at the side of the hotplate and really off it, the cooker hotplate itself is free of any appliance for ignition. It is desirable to keep the actual hotplates as simple and as free from "extras" as possible.

(3) Convenience in use: The arrangement has all the convenience of an electric switch. Only one hand is necessary to light the gas. All one has to do is to turn on the gas and with the same hand simultaneously press a rod running along the cockrail immediately below the row of taps. The action of lighting the burner is absolutely instantaneous. Pressing this rod turns on the full gas supply to the pilot light, which, becoming a ray, lights whichever ring is turned on. On removing the hand a small weight ensures that the rod returns to normal and the ray returns to a pilot light. I shall be glad to demonstrate the appliance to anyone who may care to come to see it.

While I offer this suggestion to the Industry as a peacetime development, I think the protected pilot light could be introduced immediately to save both gas and matches. Many people are wasting gas to save matches, keeping on their gas rings turned low, and keeping gas lamps burning half turned up just to provide means of ignition without matches. I even know of people doing this who have an ordinary pilot light which they cannot use because it always gets blown out. The provision of a protected pilot light would prevent all this waste.

15, Warrender Park Terrace,
Edinburgh 9.
Feb. 2, 1942.

Yours faithfully,
WILLIAM MASTERTON.

Need for Co-Operation

DEAR SIR,—I should like to comment on a question, important in normal times but even more so now. This concerns the problem of co-operation between our various technical Associations themselves, and between them and the Press. It can best be illustrated, perhaps, by reference to the particular subject I have in mind.

In March, 1940, I read an informal Paper on the Use of Burnt Oxide in Dry Purification before the Eastern District of the Southern Association of Gas Engineers and Managers. I have recently noted that a Paper bearing on the same subject has been read within the last few weeks (I cannot at the moment trace the date) by Mr. H. H. Brown, of Exeter, before the Western District of the S.A.G.E.M., and another by Mr. A. J. Doran before the Scottish Juniors at Edinburgh on Jan. 17 this year. So far as I know these Papers have not been published, but quite possibly, as in the case of mine, copies were afterwards circulated to members. Meanwhile I have been able to read, with great interest, Mr. Quarendon's recent Paper on the use of peat and peat-oxide mixtures at Billingham which has some bearing on the experiments my Company has been making. There is, however, one aspect of this subject in which we are particularly interested, and upon which we have so far seen or heard no information.

While appreciating that in these days of paper shortage it is rarely possible to publish any Paper in full or even a *précis* of most Papers,

is it not feasible for the various Associations to give previous notice in the Press of forthcoming Papers? This would at least make known to members of the Industry any topics of special interest to them and give them a chance of attending if possible (and I feel sure they would be welcome). Where, as will often be the case, distances of travel are too great, the only alternative for those interested is to solicit information by writing. It may then happen, particularly if there are several enquiries, that there are insufficient spare copies—if any copies at all are made, for they are a doubtful commitment and perhaps not warranted under present conditions. For these reasons I would stress the desirability of Authors making available either for the Press or other members a really compact *précis* of their Papers. This is a point on which you yourself, Sir, made some trenchant remarks in your invaluable Paper to the Institution in June last. This surely would involve little trouble or expense, for, if limited to one page, extra copies could quickly and cheaply be supplied from a duplicating machine as required.

Additionally I would make a strong plea for the Press to publish at not too infrequent intervals—say, quarterly—an abstract of recent Papers, limited to a few lines each, as is done in certain other technical journals. The reader would thus be cognizant within a reasonable time of any Paper in which he was interested and, provided the suggested *précis* were available, could easily establish whether his special points of interest were covered; in which case they could be elaborated later without previous unnecessary and lengthy correspondence—to say nothing of the possibility of his otherwise being in entire ignorance of such a Paper. There are, of course, certain topics over which a veil of secrecy must be preserved, but this does not apply to most technical subjects.

Oxide purification, I think it will be agreed, is one of those questions of general importance in view of the scarcity of normal supplies; but I fancy that much waste of time and overlapping is occurring through lack of co-ordination of the information available. Experiments with dry purification tend to be a long-term procedure, since 12 months and more are often required to obtain results; and at this rate the war may be over before the Industry is in possession of the gist of the numerous independent tests being carried on.

As a start I should like to suggest for consideration by the several Associations a resolution that in future all Papers must include a *précis* of not more than 200 words.

Yours faithfully,
G. L. BRAIDWOOD,
Assistant Engineer.

Gas Light & Coke Company,
Southend Works.
Feb. 4, 1942.

[Dr. Quarendon's Paper was abstracted in the "JOURNAL" of Jan. 28, while part of an extract from Mr. Doran's Paper appeared in the "JOURNAL" of Feb. 4, the remainder being published on later pages of our issue to-day. Meetings of the Eastern and Western Districts of the S.A.G.E.M. are held in private; the Press is not invited to attend.—ED. "G.J."]

The Aims and Functions of Publicity

Prestige Advertising

The B.C.G.A. write to us to say that some controversy has arisen over the article under the above title which appeared in the issue of the "GAS JOURNAL" dated Nov. 26 last. It was not intended, they point out, that this article should be understood as opposing goodwill and prestige advertising of all kinds; in fact the author wished to convey the view (about which agreement is as general as about few other propositions in advertising) that public utility undertakings have a peculiar need for goodwill advertising. At the same time, as was pointed out in the article, the utmost care should be exercised in the selection of the theme for prestige and goodwill advertising. The commercializing of important national problems may have the opposite effect on the reader to that hoped for by the advertiser. Any advertiser would try to avoid wasteful advertising if he could recognize it; this is the barest common sense. Wrongly used, therefore, it is undoubtedly possible for advertising to be worse than negative and to produce positive bad-will. This does not rule out the possibility of advertising which increases the respect and liking which the public have for a business concern. Gas undertakings need advertising of this kind, and there is no doubt that their use of such advertising over a considerable period has been very successful, and can continue to be so in the future.

The Institute of Physics is arranging a Conference on "X-Ray Analysis in Industry" to be held in Cambridge on April 10 and 11. The purpose of the Conference is to promote the interchange of knowledge and experience between those employing X-ray analysis (diffraction methods) in their work in different fields and to arrange for further collaboration between physicists, engineers, chemists, and others towards the solution of problems by its methods. During the Conference the President, Professor Sir Lawrence Bragg, will lecture on "The History and Development of X-Ray Analysis." Further particulars can be obtained from the Secretary of the Institute of Physics. Temporary Address: The University, Reading, Berks.

Directorate of Gas Supply

New Appointments

The President of the Board of Trade has authorized the Director-General of Gas Supply to appoint in each Regional Defence Area a Liaison Officer of the Gas Directorate whose main function will be to keep the Directorate informed of the position of all gas undertakings in his Region. He will also be the normal channel of communication between gas undertakings on the one hand and Regional Representatives of the Production Ministries on the other.

Appointments have already been made as given below:

Region.	Liaison Officer.	Address and phone No.
No. 7 South-Western	J. N. Hazeldon.	26, Baldwin Street, Bristol, 1. Bristol 22852.
No. 9 Midland	C. W. Jamieson.	Cavendish House, Waterloo Street, Birmingham. Central 7391.
No. 10 North-Western	A. Fisher.	22, Byrom Street, Manchester. Blackfriars 0308.

Other appointments will be made as soon as possible.

Economy Begins at Home

The Gas Light and Coke Company Saves Gas

During the quarter ended on Dec. 31, the Gas Light and Coke Company burned 21,000 fewer therms of gas in their own offices and showrooms than they did in the corresponding period for 1939. This is equivalent to a saving of about 300 tons of coal. As a basis of comparison 1939 was chosen rather than 1940 because conditions were more nearly equal.

But for two factors the saving would have been greater. In 1939 there were no fire watchers to be accommodated at night and provided with warmth and light—now the Company has several hundreds; and in the past year a number of new staff canteens have been opened or existing ones enlarged. This has meant greater consumption of gas for cooking.

Mr. A. E. Sylvester, General Manager of the Company, realized some months ago that if the public were to be persuaded of the need for fuel economy, the company itself must show a good example. In other words economy begins at home. In a big concern like the Gas Light and Coke Company, where the staff runs into thousands and where, in wartime, many of the premises are occupied for 24 hours a day, genuine fuel economies can only be effected with the goodwill and active co-operation of the staff. Mr. Sylvester was convinced that everybody concerned had only to understand the situation fully to give wholehearted support to fuel economy. He therefore called together the heads of departments and with them worked out plans for getting the idea over. Two of the most effective have been the nomination of a Fuel Economy Officer for each office, whose responsibility it is to encourage fuel economy, consistent with the welfare of the staff; and the widespread and prominent display of progress charts on which gas consumption is compared with the consumption for a corresponding earlier period. The Fuel Economy Officer makes it his business to see that his staff knows whether that particular office is doing well or badly in the campaign, and in this way the co-operation of the Staff has been fully enlisted.

The 21,000 therms of gas saved show that the staff *are* co-operating. The following suggest some of the ways in which economies have been effected:

The staff has been reorganized so as to occupy as few rooms as possible to save heating and lighting.

In pre-war days it did not much matter how many fires were left burning in the showrooms. Now only just enough heating is maintained to keep the staff reasonably comfortable. If an extra fire is lit for demonstration purposes it is turned off the moment the demonstration is over. The public notice this care, and it sometimes provides an opportunity to discuss fuel economy with members of the public.

In one big office the ventilation system has been overhauled; as a result less heat is needed.

When the staff go home at night, instead of leaving the lights and fires on they remember to turn them off. This has become a point of honour.

Under a Board of Trade Order (S.R. & O. 1942, No. 172, price 1d.) which comes into force on Feb. 24, 1942, export control is extended to gas meters of a type commonly used for registering and recording the consumption of coal gas. Licences will, in future, be required to export pyrometers, and fittings, wholly or mainly of metal, of a kind used for street or interior lighting.

A Meeting of the Eastern District of the Southern Association of Gas Engineers and Managers will be held at Gas Industry House on Wednesday, Feb. 25, at 2.30 p.m., when Mr. J. H. Dyde, M.Sc., Engineer and General Manager of the North Middlesex Gas Company, will open a discussion on "Present-Day Problems."

REPORT OF THE GAS RESEARCH BOARD

[Abstract]

THE Second Annual Report of the Council of the Gas Research Board for the year 1940–41 has been published (Publication G.R.B. 4), and from it the following is abstracted:

Throughout the year 1940–41 the Council of the Board has actively pursued its programme of investigations, and has maintained its collaboration with Government Departments, primarily in furtherance of the national war effort, and its contacts with kindred research organizations. Inevitably, under prevailing conditions, the progress of the researches of the Board and the development of its general activities have not been as rapid as the Council would have desired and as they would have been in normal circumstances.

The Board has become a legal entity, and the Council has proceeded to consider applications for membership of the Board. The Council appointed the following Membership Committee to advise it upon all matters relating to membership of the Board and to consider and recommend upon all applications for membership: Dr. E. W. Smith (*Chairman*), Mr. Stephen Lacey, Mr. R. J. Rogers, Col. H. C. Smith, Mr. Ernest West, two Vice-Presidents and Chairman of Council (*ex officio*).

A first batch of applications for membership has been received and the Council, at its meeting on Oct. 7, 1941, elected as Ordinary Members of the Board 139 gas undertakings and 51 other British corporations (incorporated bodies).

After consideration of its Budget for 1941, the Council made a request to the Council of The Institution of Gas Engineers for a contribution out of the Special Purposes Fund of the Institution of £12,000 for the current year. This represents the aggregate allocation to the Gas Research Board out of the contributions to the National Gas Organizations from gas undertakings. The Council of the Institution agreed to this sum being paid to the Board in equal quarterly amounts.

A sum of £100 has been received by the Institution from the Society of British Gas Industries as a contribution towards expenses incurred in the formation of the Gas Research Board. The appreciation of the Council has been conveyed to the Council of the Society.

The 32nd Report of the Refractory Materials Joint Committee is separately published. It is regretted that, owing to the wartime requirements of official secrecy, a detailed report of the work of the Joint Research Committee cannot be separately published. A brief account of this work is, however, given later. The Reports of the Board are being made available to any interested persons and contributions to a written discussion of them will be welcomed.

The main subject of investigation of the Joint Research Committee of the Gas Research Board and Leeds University continues to be the production of town gas by the partial or complete gasification of coal in hydrogen under pressure. In essence, the process involves the enrichment of water gas by means of methane produced in the reaction vessel under the appropriate operating conditions, assisted, if necessary, by catalytic synthesis of methane from the reaction gases. The laboratory experiments by the research staff working for the Committee at Leeds University had reached a stage when it became desirable to transfer the work on to a larger scale, and semi-scale experiments had been planned, immediately before the war, in co-operation with the Fuel Research Board. An advisory Joint Committee on Complete Gasification under Pressure, comprising representatives of the Joint Research Committee and of the Fuel Research Board, was constantly reviewing the progress of this work.

It was stated in the 1st Annual Report of the Council that circumstances arising from the war had made it impossible to proceed with these larger-scale experiments, and there appeared until recently to be no immediate prospect of any improvement in this position. After consultation with the Fuel Research Board, however, it has now been agreed that the reaction vessel and ancillary plant that were to have been installed at the Fuel Research Station for this investigation shall be transferred to and erected at a more convenient site, where the requisite facilities will be available. Plans are being prepared for the erection of this semi-scale plant at the earliest opportunity. The Council has appointed the following Hydrogenation Sub-Committee to consider and make recommendations concerning these plans and estimates and generally concerning the large-scale investigation of hydrogenation and complete gasification: Mr. E. V. Evans (*Chairman*), Mr. J. E. Davis, Dr. F. J. Dent, Dr. A. Key, Dr. J. G. King, Dr. E. W. Smith, Col. H. C. Smith, Mr. Ernest West.

In the meantime the investigation of the catalytic synthesis of methane, which is a part of the major problem under examination by the Joint Research Committee, has been actively pursued under the guidance of the Joint Committee on Complete Gasification under Pressure. In view of the fact that the work of this Joint Committee has been almost wholly concerned with this aspect of the problem and that a special Hydrogenation Sub-Committee has now been appointed to deal with the large-scale investigation of hydrogenation and gasification, it has been decided to change the name of the Joint Committee to the Joint Committee on Methane Synthesis and to amend its terms of reference to the consideration of the synthesis of methane, with particular reference to catalytic methods, and any matters connected therewith.

Considerable progress has been made in this investigation, though the results obtained have not been entirely as anticipated. The reaction conditions to be adopted are likely to depend upon circumstances and, with the object of clarifying the position still further, two semi-scale units of different design have been erected by the Joint Research Committee and the Fuel Research Board respectively.

The work on methane synthesis by catalysis has involved a thorough investigation of methods for the removal of organic sulphur compounds from town gas and water gas, since the best synthesis catalysts are liable to poisoning by sulphur compounds.

The Sub-Committee on Combustion Characteristics of Town Gas has continued its review of the experiences of gas undertakings with regard to the value of the Aeration Test Burner in relation to the performance of gas in consumers' appliances. It is difficult, particularly under existing conditions, for gas undertakings to compile reliable and significant data on this subject, but the Sub-Committee hopes, when sufficient evidence has been collected, to prepare a report of its findings. The Sub-Committee has had under consideration other matters more directly related to wartime conditions, notably the combustion characteristics of substitutes for town gas. The fundamental aspects of inhibitors and promoters of flame-speed are also being reviewed. The Sub-Committee is not itself, however, at present undertaking any experimental work in these matters.

The Refractory Materials Joint Committee of the Gas Research Board and the British Refractories Research Association Committee has approved the recommendation of its Specifications Sub-Committee that the Specification for Refractoriness Safety Test for Siliceous Material, p. 5, clause 2(b) of the Standard Specifications for Refractory Materials for Gas Works (*Institution Publication No.* 94), be amended to read "(b) not less than Seger cone 27 (about 1,610°C.) for Siliceous Material," and that a similar amendment be made in the last line of p. 9, clause 20, which shall now read as follows, " . . . less than Seger cone 27 (about 1,610°C.)."

The Testing Committee of the British Refractories Research Association, on which the Gas Research Board is represented, has published a memorandum on "Tentative Methods of Testing Refractory Materials" (B.R.R.A. Special Publication No. 3), which is being widely circulated for comment.

The Specifications Sub-Committee has continued its work of preparing recommendations for the revision of the Standard Specifications for Refractory Materials for Gas-Works, and this work has been co-ordinated with that of the Testing Committee of the British Refractories Research Association.

Noises of Gas Burners.—The investigation by the National Physical Laboratory for the Gas Research Board of the cause of noise in gas burners, a preliminary Report of which was published a year ago (*Communication No.* 3), has been extended to include operation at higher gas pressures. Further work has also been done on tap hiss, but this has not reached a stage at which any definite conclusion can be drawn. It has been found necessary, in view of present circumstances, temporarily to suspend this investigation.

Wind Stresses in Spirally-Guided Gasholders.—In the investigation by the National Physical Laboratory for the Gas Research Board, of wind stresses on spirally-guided gasholders, the integration of the pressure distribution measurements in the case of a model fitted with guide rails has been completed. Agreement between the actual force measurements and those deduced from pressure distribution is reasonably good, and useful new information has been obtained. Variation in guide rails is found to have considerable effect on the pressure on the holder in the immediate neighbourhood of the rails. It is hoped to publish a report dealing mainly with the aerodynamic aspects of the problem.

Luminescence Phenomena.—The Council has been particularly interested to note the results published by the Second Arthur Duckham Research Fellow (*Institution Communication No.* 237) of his study of the phenomena of luminescence, with particular reference to the verification of its occurrence when gas flames impinge upon certain solid substances. The investigation has brought to light the dependence of the luminescent emission in such circumstances on the presence in the parent materials (host lattices) of a small quantity of some other compound, a so-called "activator." A number of materials have been examined, and it has been found that for the maximum production of luminescence an optimum concentration of the activator is required in each case.

The nature of the light emitted has been examined spectrographically. In all cases so far examined the luminescent radiation ceases to be emitted when the surface of the solid is heated to incipient redness, but no confirmation has been found of earlier claims that in certain cases the normal thermal radiation of incandescent solids is supplemented by luminescent radiation. On the other hand, the behaviour of such substances when heated to incandescence in a flame shows certain abnormalities which can only be explained by (*a*) an abrupt change in their thermal conductivity, or (*b*) an abrupt change in their infra-red emissivity, or (*c*) some catalytic influence of the surface on the mechanism of combustion in the flame. It is thought

that the elucidation of these latter phenomena may be of some importance in the consideration of the design of gas-heated furnaces, and the like. The Council considers that further knowledge of the fundamental principles involved in these phenomena is desirable, irrespective of any immediate prospect of commercial application, and it has resolved to arrange for a continuation of the investigation after the completion of the tenure of the Award at Leeds University by the present Fellow (Dr. E. C. W. Smith).

A possible commercial application of one aspect of this work relates to the use of infra-red radiation in industrial drying processes. The Yorkshire Industrial Gas Centre has been interested in this question, and the Council is in consultation with the Industrial Gas Centres Committee as to the general industrial application of infra-red radiation.

Coke for Portable Gas Producers.—It was recorded in the 1st Annual Report of the Council that the Gas Research Board had been entrusted by the Mines Department with an nvestigation of methods for the production at gas-works of reactive coke for portable gas producers for road vehicles. The investigation, which has been carried on throughout in close collaboration with the Fuel Research Board and the British Coal Utilization Research Association, has involved the production at selected gas-works of trial batches of coke under specified conditions, and the testing of these cokes both in the laboratory and in producer vehicles on the road. The information has been collated by the Council and a detailed report of the results, including estimates of the cost of producing these specially reactive cokes, has been submitted to the Mines Department.

The investigation has confirmed that cokes having sufficient reactivity to be suitable as fuel for portable gas producers can be made from a variety of coals in commercial gas retorts. It is important to note, however, that the processes available for this purpose will require additional supplies of coal if the present supply of town gas from the works in question is not to be reduced, the magnitude of such additional supplies depending upon the particular process adopted. Further, the effect on the solid fuel market of diverting carbonizing plant from the production of normal gas-works coke to special producer fuel would need to be studied and adjusted in each case.

Coke for Open Domestic Grates.—The Council has had under consideration the possible production at gas-works of coke, activated by addition of alkali, suitable as a fuel for ordinary open domestic grates. It has noted the following points, *inter alia*, in this connexion: (*a*) It is not necessary, in order to prepare alkali-activated coke, to mix the alkali with the coal before carbonizing. Coke can be activated by impregnation after leaving the retort. (*b*) To obtain the most reactive coke it is necessary to select, from within a specified range, the class of coal carbonized and to carbonize it under controlled conditions in continuous vertical retorts.

The question is being further examined by the Council.

Hydrogen.—The Council has continued to collaborate with the Director of Hydrogen Production (Air Ministry), with particular reference to the selection of suitable sites, available plant, and modified processes for the production of hydrogen.

Tar-Lime Mixtures.—The Council has reviewed the work of Mr. H. J. Hodsman (Leeds) on the alteration of the properties of coal tars by admixture of lime and the possible application of such tar-lime mixture for vatious purposes. A memorandum, submitted by Mr. Hodsman at the request of the Council, has been discussed and the matter is receiving further consideration.

Gas Purification Material.—The Council has noted with interest the work that has been done by Imperial Chemical Industries (Fertilizer and Synthetic Products), Ltd., on the removal of hydrogen sulphide from water gas and coal gas by means of sulphur bacteria in peat. Close contact on this subject is being maintained with Imperial Chemical Industries, Ltd., and with gas undertakings having experience of the use of peat for gas purification.

OXIDE PURIFICATION—SOME WARTIME EXPERIMENTS*

By A. J. DORAN,

Chief Chemist, Edinburgh Gas Department

(*Continued from p. 170*)

A second batch containing 8% less of burnt oxide was prepared and came under observation. Before proceeding to give the results it will be of interest to show the cost of its preparation, which was as follows:

Burnt spent oxide	£38	0	10
Soda ash	45	7	6
Sawdust	20	0	0
	103	8	4
Carriage on oxide	8	2	1
Labour employed	15	12	11
	£127	3	4

Taking the figure of 108 tons this would equal a rate of 23s. 7d. per ton. The composition of this batch of material was as follows:

Burnt spent oxide	72.05	tons (34% moisture).
Soda ash	5.5	,,
Sawdust	11.0	,,
Water added	19.45	,,
	108	,,

This material was in operation for a period of 94 days, 43 of which it operated in the second position, the H_2S content at the inlet being 164 grains and giving an efficiency of 98%. In the foul box position pressure was not found to be excessive, but after 23 days the temperature showed a rise of 14°F. As this temperature increase had been apparent for some time it was realized that the material must have dried considerably, so the box was emptied for examination. On emptying it was found that the material had dried very considerably and exhibited fiery symptoms requiring rather heavy watering. The sulphur content amounted to 23.2%, which was highly satisfactory. This material was considered too active and dilution with other material was employed.

Two further batches are at present in use, one in which a coarser type of sawdust is in use, the other being a mixture of equal parts of this material and Dutch bog ore. The latter box is working satisfactorily, and needs no further comment. The former, however, has not achieved a desired result—*viz.*, the reduction in differential pressure—and has thus led us to the conclusion that sawdust, no matter the grading, is not an ideal opening material as it lacks resiliency. Thus our attention had to be given to procuring a substance more suitable. Peat, if procurable, seemed to us a most likely substance, and samples of moss litter and peat tailings (fine and granular) were obtained. Of the three samples the granular appeared the most likely, and it was found that this could be obtained from a firm within a 20-mile radius.

A preliminary quantity of 5 tons was obtained. It was received in a compressed form in 2 cwt. bales. On releasing the binding no difficulty was experienced in breaking down the material. The composition of this batch consisted of the following:

Burnt spent oxide	53	T. dry basis.
Soda ash	5.5	T. ,,
Sawdust	14.0	T. ,,
Peat	4.5	T.
Total	77.0	

To this was added sufficient water, the total weight amounting to approximately 120 T. The total cost of this material and preparation amounted to £150 = 25s. per ton. This material came into operation on Oct. 1, 1941, as third box and remained in this position for 22 days. The H_2S at inlet averaged 21 gr./100 cu.ft., and at the outlet *nil*, giving an efficiency of 100%. As second box the inlet H_2S averaged 135 gr., the outlet averaging 12 gr. over a period of 39 days, giving a 91% efficiency. It operated as foul box for a further 26 days, with average efficiency of 82%, the inlet H_2S content being 328 gr. and the outlet 59 gr. The efficiency for the total period was 86%.

The differential pressure never exceeded 6.1 in. W.G. and the temperatures were as expected. The analysis of the material showed a moisture content of 26.2% and a sulphur content of 24.4% (dry basis).

This run has proved in all respects highly satisfactory and could have been continued for a longer period, as it was found that only two-thirds of the material had been fouled. It is evident that we are well on the way to solving pressure difficulties, and it is probable that such a mixture will form the basis of our standard product.

A further batch consisting of the following has been prepared and is ready to come into action:

Burnt spent oxide	44	T. dry basis.
Soda ash	5.2	T. ,,
Peat	11.0	T.
Total	60.2	

The total weight of material into box was approximately 100 tons, with a moisture content of 43% and at a total cost of £138 = 27s. 7d. per ton.

In addition to our own experimental work we have been indebted to the Geological Survey Department of Great Britain, who have been rendering valuable assistance in an attempt to locate in Scotland possible deposits of natural iron ores suitable for gas purifying. To date some 20 samples have been submitted to us for analysis and exami-

* From a Paper to the Scottish Junior Gas Association (Eastern District), Jan. 17, 1942.

nation. These samples have been drawn from the Dumfries area to as far north as Shetland. It is not my intention to go into details regarding each sample, but to deal mainly with one or two of the more interesting. Each sample submitted was examined, analyzed, and subjected to our laboratory fouling test. Among the samples submitted two were classified as ochres. These contained a very small quantity of iron oxide, which, however, was in a highly active state, but the insoluble matter, which amounted to some 80%, ruled them out. Two other samples submitted from Dumfries and Stirling respectively at first sight appeared to be ideal substances. Quoting my official report I said, "The material was reddish brown in colour in damp condition, soft texture with some rooty fibrous matter present, general appearance very similar to a natural Dutch bog ore."

The analysis proved, however, that the samples contained only in the region of 12% ferric oxide and this not in an active state.

A sample was submitted from the Island of Raasay, the appearance of which was very unsatisfactory; the analysis showed this material to contain 63.4% of ferric oxide, but only a very small proportion was active.

The most promising results to date come from the North of Scotland area, Inverness, Caithness, and Shetland. The sample submitted from Shetland had a chocolate colour, and was in a moist condition, free from hard lumps, with a quantity of rooty fibrous matter present. The material had a soft texture. Its analysis was as follows:

Moisture	50.8%
Insoluble matter	0.1%
Loss on ignition	11.02%
Lime	*Nil*
Alumina	Trace
Ferric oxide	36.64%

The material after being submitted to our standard fouling test gave an average figure of 9% sulphur per fouling as compared with the natural oxide figure of 6.4%. This was the best sample submitted to date and was a deposit found by a roadside. It has since been ascertained that the quantity available is in the region of 1,000 tons and may be of direct interest to our friends in the Industry situated in the North.

The samples submitted from Inverness were of particular interest by reason of the fact that they consisted of peat, which shortly afterwards had some prominence in our Technical Press. The sample consisted of (1) unburnt peat, (2) partially burnt peat. The reason for submitting these samples was that the residues from the burnt peat exhibited very similar properties to our natural ore; the burning, by the way, had been quite accidental. The analyses of the two samples were as follows:

	Unburnt.	Partially Burnt.
Moisture	59.45%	23.4%
Insoluble matter	1.87%	8.58%
Loss on ignition	31.08%	28.27%
Lime	0.97%	0.8%
Ferric oxide	6.37%	38.76%
Sulphur absorption	2.6%	6.4%

The two samples both contain iron in an active condition, the burnt material being similar to Dutch bog ore. However, as this was the result of uncontrolled combustion it would possibly be difficult to reproduce, and in any case it may be of interest to note that 6 parts by weight of peat would be required to produce one part of the other. The unburnt peat looked a very suitable diluent for our own preparation, and a laboratory sample of equal volumes was prepared and submitted to our usual test and gave an average result of 7.1% sulphur. Comparing the two individual results 2.6% and 3.8% (our own materia) it is apparent that a much enhanced activity is produced. The samples submitted from Caithness in the first instance were three in number. The samples as received were very small and had dried up considerably. Superficial examination showed the material to be brown and to exhibit a honeycomb structure. The material contained approximately 70% Fe_2O_3 and in addition a very small quantity of manganese was present. The sulphiding tests were of such an order as to indicate that a fair proportion of the iron was in a very active condition. As these preliminary results were so promising, it was considered advisable to ask for a much larger sample, which was eventually procured. This sample gave the following percentage analysis:

Moisture	5.86
Loss on ignition	21.19 (including 4.25 CO_2)
Silica	1.40
Lime	2.54
Alumina	*Nil*
Ferric oxide	66.84

This sample was again in a very dry condition, alkaline to litmus, and contained no rooty fibrous matter. Our standard fouling test gave an average figure of 7.6% sulphur, this being a very satisfactory figure. The active iron was present in sufficient quantity to warrant its use. On the other hand, the absence of organic matter, moisture, and the fact that it was in lump form were features against it. Having in the laboratory at this particular time a quantity of Irish bog ore (giving a similar fouling test result), advantage was taken to prepare a mixture which eventually gave such a satisfactory result that this Caithness product, given the correct treatment, could yield a highly satisfactory purifying agent. To prove this it was decided to obtain an adequate quantity to permit of a suitable mixture being prepared so that it could be tested in our experimental box as previously described.

The percentage analysis of the Caithness material as received was as follows:

Moisture	37.53
Loss on ignition	13.34
Silica	0.86
Lime	0.75
Iron (Fe_2O_3)	46.00

This material had obviously been freshly dug, and was similar in appearance to a natural oxide with the exception that there was an absence of organic matter. A preparation consisting of the following was prepared:

Caithness	15 cwt. as received
Sawdust	2 " "

to which was added a quantity of water giving a final moisture content of 37.5%.

The material came into action on June 18, 1941, and continued in constant operation for 82 days. The total gas passed was 610,000 cu.ft., and the average H_2S content at the inlet was 334 gr. per 100 cu.ft. and at the outlet 20 gr. Thus an average efficiency of 94% resulted. The efficiency had, however, on the last day dropped to 74%. The material when emptied appeared to have fouled fairly well and readily revivified with a considerable evolution of heat. The average temperature over the mass was 64°C., the atmospheric temperature being 16°C. The theoretical sulphur content based on the observations made amounts to 17% while the actual figure was 15%. The moisture content had only dropped to 33.6%.

The second run commenced on Sept. 13, 1941, and operated for 91 days. The gas passed during this second run was 780,000 cuft., giving a total of 1,390,000 cu.ft. The average inlet H_2S content was 310 gr./100 cu.ft. and the outlet 33 gr./100 cu.ft., giving an average efficiency of 89%. At the conclusion of the run the efficiency was 75%. Revivification was readily accomplished with slight heating. The moisture content of the material was 27%, and the sulphur content 31% (dry basis). The theoretical sulphur content was 31%. The good impressions gained from the laboratory tests made on this material have been fully justified. This oxide of iron is very active, and with the addition of a suitable diluent a high class purifying agent results.

In addition to the foregoing, two samples from the West Calder area were received late and proved of great interest. They consisted of peat and its overlying substance, the latter having the appearance of dark yellow ochre in a fairly dry condition and containing traces of organic matter. The peat, on the other hand, was jet black, damp, had a soft velvety texture, with rooty fibrous matter present. The percentage analyses of the two substances were as follows:

	Iron Oxide as recd.	Peat as recd.
Moisture	25.67	73.0
Loss on ignition	13.16	22.82
Silica	0.16	0.43
Lime	*Nil*	*Nil*
Alumina	*Nil*	*Nil*
Ferric oxide	60.78	3.57
Sulphiding test av. of 5 foulings dry basis...	8.0	3.8

The iron oxide present is extremely active, in fact probably the most active and suitable material yet submitted, and I consider a mixture of the two would produce an excellent natural purifying material. The quantity of deposit available is being investigated. A point of interest arising from the analysis of the peat was the fact that it appeared to exhibit gas-making properties. In actual fact a H.T. assay made on the dried sample gave a thermal yield of 81.7 therms per ton, the C.V. of the gas being 648 B.Th.U.

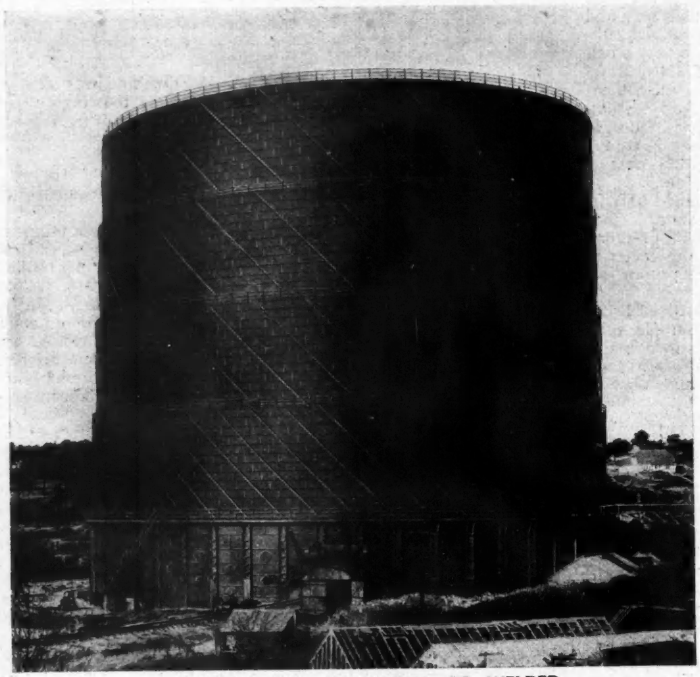
We have to date produced approximately 1,000 tons of our preparation at a cost of approximately 26s. per ton, and I would submit that this fact speaks for itself. The low cost of preparation must, I feel sure, appeal to all gas engineers. In view of the technical and financial success of the process, I believe that what had originally been intended to be only a wartime measure will become regular peacetime practice.

The point which strikes one is its simplicity of production, although it must be emphasized that intimate mixing is essential. It is our experience that sawdust alone as a lightening material is not suitable, but a complement of equal volumes of sawdust and peat is very suitable, provided the soda ash-iron oxide ratio is maintained.

The various samples submitted by the Geological Survey Department have proved most interesting, and provided the investigations being made as to the extent of the deposits prove successful, a new industry may arise in Scotland. The experimental work is still in progress, and I hope to be able to give some further information relative to the chemical mechanism of the process at a later date.

In conclusion I would like to express my thanks to Mr. S. Glass, of our Chemical Staff, for his able co-operation in the development of the process.

A Joint Meeting of the Coke Oven Managers' Association and the Institute of Fuel together with the Iron and Steel Institute and The Institution of Gas Engineers will be held at the Royal Victoria Station Hotel, Sheffield, at 2.30 p.m. on Wednesday, Feb. 25, when Mr. J. G. Bennett, Director of the British Coal Utilization Research Association, will present a Paper entitled "The Future of Coke." The Paper, advance copies of which can be obtained on application to the Secretary, The Institute of Fuel, 30, Bramham Gardens, London, S.W. 5, will be followed by a discussion.



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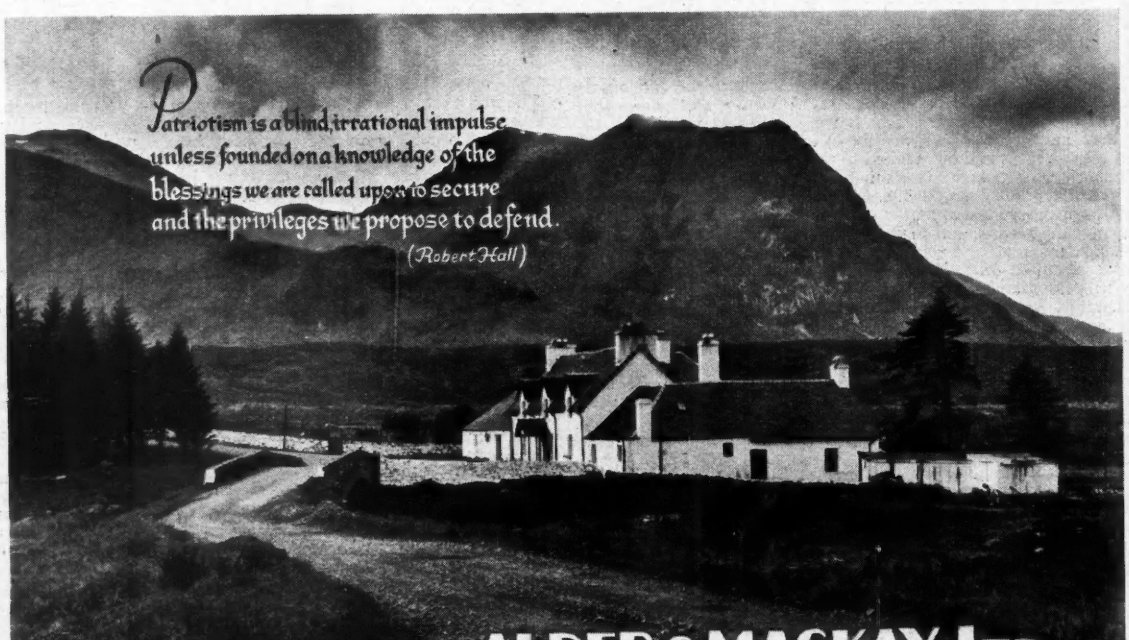
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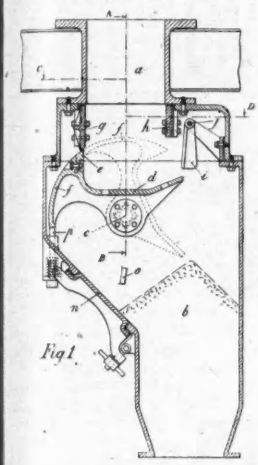
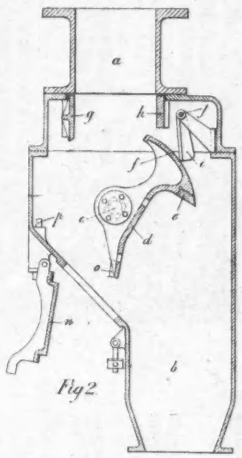
NEW PATENTS

Extracting Coke from Vertical Retorts

A coke extractor of the oscillating type which effects extraction uniformly over the whole length of the retort is the subject of a patent (No. 541,608; application date, Sept. 14, 1940) taken out by Sir F. J. West, E. West, and West's Gas Improvement Company, Ltd.

Fig. 1 is a sectional elevation of the base of a retort and the coke chamber, with a coke extractor constructed and arranged in one





convenient form in accordance with the invention. Fig. 2 is a view similar to fig. 1, but with the extractor in a position to permit inspection and repair of the retort.

a indicates the base of the retort and *b* the coke chamber. The coke extractor which turns about the horizontal axis *c* comprises (1) a base or step *d* upon which the coke rests when the extractor is in its service position as shown in full lines in fig. 1, (2) a riser or vertical side *e* which with the extractor in its service position constitutes a continuation of a wall of the retort, and (3) a cut-off plate *f* which is part of a cylinder having its axis at *c*.

The retort side walls have renewable continuation pieces *g* and *h* at opposite sides, the piece *g* coming substantially into line with the riser or vertical side *e* of the extractor. The length of the piece *h* is such as to provide a clearance between itself and the leading edge of the cut-off plate *f* so that when the extractor is turned from the full line to the dotted line position in fig. 1 in order to effect coke discharge, trapping of the coke between such leading edge and the piece *h* will not prevent the full movement of the extractor.

A series of plates *i* is provided freely suspended at their upper ends from a spindle or spindles *j*, at the side of the extractor at which coke discharge takes place, such plates serving to limit or prevent flow of coke off the extractor from the retort when the extractor is returned to its service position beneath the retort after a coke discharge operation. When the extractor returns to its service position there is a vertical drop of coke from the retort on to the step or base *d*.

The extractor is carried by two trunnion-like spindles *k*, to one of which may be secured a crank arm by which oscillatory movements are imparted to the extractor with the aid of any suitable reciprocatory mechanism.

There is a door *n* upon the coke chamber which when opened as shown in fig. 2, and with the extractor also as shown in fig. 2 against any suitable stop such as *o*, permits rods or the like to be passed up into the retort for various purposes. There is a resilient stop at *p* to limit the movement of the extractor when it is being returned to its service position after a coke discharge operation.

When the retort is in normal operation, the charge in the retort is supported by the base or step *d* of the extractor. When coke discharge is to be effected, the extractor cuts off from the charge above it, the coke which comes below the area swept out by the cut-off plate *f* of the extractor in moving from the full to the dotted line position in fig. 1. The cut-off plate then supports the charge in the retort. After coke discharge, the extractor is returned to its full line position, and there is a fall or drop of the charge in the retort through a vertical height corresponding to that of the step *e*. This vertical drop of the charge as a whole in the retort is important in securing satisfactory working. The movement of the extractor from the service to the coke discharge position—that is from the full line to the dotted line position in fig. 1—does not involve any appreciable amount of lifting of the charge in the retort, which is also of great importance in securing satisfactory operation of the retort. The extractor operates over the entire length and width of the base of the retort.

The extractor is operated at intervals. For example, a complete forward and return stroke may be made at intervals of from 30 to 45 minutes, this period depending upon the rate at which carbonization proceeds in the retort. The forward and return speeds may be different. The volume of coke tipped into the coke chamber is approximately equal to the volume swept out by the extractor between its vertical side or riser and the bottom or step upon which the coke rests.

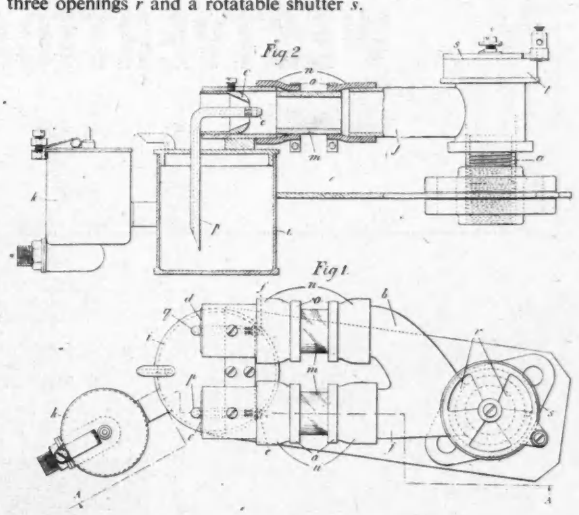
Mobile Gas Producers

A new patent (No. 541,836; application date, May, 9, 1940) relating to mobile gas producers has been granted to Parkinson & Cowan (Gas Meters) Ltd. and E. W. L. Cowan. The object is to provide improved or simplified means whereby automatic control of the air and water feed may be effected so that gas of constant or substantially constant composition may be delivered irrespective of the magnitude of the gas output.

The invention consists briefly in the provision, for automatically controlling the incoming supply of water to an atomizer in the air-inlet of a gas producer, whereby at all load conditions gas of substantially constant composition is produced, of means determining the proportion of water feed to the atomizer, in relation to primary air entering the producer, in dependence upon the quantity of primary air flowing.

Referring to the accompanying diagrammatic drawings: Fig. 1 is a plan view of one arrangement, and fig. 2 a side view partly in section on the line A—A. The duct *a* illustrated in fig. 2 is divided into two branches *b j* joining it at an angle, and both branches are furnished behind the junction with choke tubes *c d* and jets *e f*. The ducts each embody sighting sections *m*. The atomizing jets *e f* are supplied with water through tubes *p q* from a constant level tank *i* fed by a float chamber *k* which keeps the level of the water some distance below the jet orifices and the air supply passes both jets before uniting at the junction beyond them.

In the main branch *j* the jet *e* is comparatively small and the choke *c* is also small, while in the subsidiary branch *b* both jet *f* and choke *d* are larger. The branches *b* and *j* embody viewing sections comprising short lengths of stout gauge glass tube *m*, rubber tube lengths *n*, and clips *o*. An extra air-entry control device *t* is provided furnished with three openings *r* and a rotatable shutter *s*.



In operation, when gas is drawn from the collecting ring (not shown) through duct *a* at very slow speeds, the main branch *j* yields water while the branch *b* does not. At higher speeds, however, the main duct *j* does not provide sufficient water relatively to the air, and this deficiency is compensated by the supply from the subsidiary branch pipe *b* which under these conditions supplies additional air and water. Thus, at medium and higher speeds both branch ducts *j* and *b* yield water.

By suitable choice of the dimensions and arrangement of the jets and choke tubes and the size and shape of the main and branch ducts and their junction, with consequent different frictional resistances in the two ducts, a close approximation to a constant composition of the vapour supply to the producer may be obtained and consequently a substantially constant composition of the gas produced within a wide range of output.

Compensation may be achieved by automatic relative displacement of the water jet and choke tube.

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Gas Products Prices

The London Market Feb. 9.

There is very little movement in the prices of Coal Tar Products, as many of the usual markets are no longer available and pitch/creosote mixture as a fuel oil has taken their place.

Pitch is still a nominal market, but for such quantities as are being sold the price ranges between about 45s. and 50s. per ton. Creosote is about 5d. to 6d. per gallon. With regard to refined tar the price for next season has not yet been definitely fixed and it is expected that this will come under a Direction to be issued by the Coal Tar Controller. Pure toluole remains 2s. 5d. per gallon under the Ministry of Supply Toluene No. 2 Order. Pure benzole is about 1s. 10d., 95/160 solvent naphtha is 2s. 5d. to 2s. 9d. and 90/160 pyridine remains about 13s. 6d. per gallon. All the above prices are *ex* Makers' Works. Naphthalene prices are unchanged and are in accordance with the Control of Tar Order 1941. The Order refers to maximum prices, and the figure for refined crystal naphthalene in 2-cwt. bags and 4-ton lots is £23 per ton delivered:

The Provinces Feb. 9.

The average prices of gas-works products during the week were: Pitch and Crude Tar,* Toluole, naked, North, 1s. 10d. (controlled by the Control of Toluene No. 2 Order, July 5, which fixes the maximum price at which this material may be sold). Coal tar, crude naphtha, in bulk, North, 11d. to 1s. Solvent naphtha, naked, North, 1s. 9d. to 1s. 10d. Heavy naphtha, North, 1s. 9d. to 1s. 10d. Creosote, *ex* works, in bulk, North, liquid and salty, 4½d. to 4¾d.; Scotland, 4½d. to 4¾d.; low gravity, 4¼d. to 4½d. Fuel Grade, 4d. to 4¼d. Carbolic acid, 60's, 3s. 7½d. to 3s. 9d. Naphthalene, £15 to £20. Salts, drained, £6 to £6 10s.; whizzed 72°, £7 15s.; 78°, £9 5s. Anthracene prices fixed by Controller. Heavy oil: Unfiltered anthracene oil (min. gr. 1,080), 6d. to 6½d.; filtered heavy oil (min. gr. 1,080), 6½d. to 7d.; heavy anthracene oil gr. less than 1,080, 5¾d. to 6d.

*In regard to pitch and crude tar prices we would ask readers to refer to the editorial note on p. 396 of the "JOURNAL" for Sept. 10, 1941.

Tar Products in Scotland

GLASGOW, Feb. 7.

Throughput well maintained. Refined tar 4¾d. to 5d. home and 4½d. to 4½d. per gallon export. Creosote oil scarce: Specification oil, 6d. to 6½d.; low gravity, 6¾d. to 7½d.; neutral oil, 6½d. to 6¾d. per gallon; all *ex* Works in bulk. Cresylic acid difficult. Pale 99/100%, 4s. 9d. to 5s. 3d.; Pale 97/99%, 4s. 3d. to 4s. 9d.; Dark 97/99%, 4s. to 4s. 3d. per gallon; all *ex* Works in buyers' packages. Crude naphtha 6½d. to 7d. Solvent naphtha: 90/160 grade 2s. per gallon and 90/190 Heavy Naphtha 1s. 9d. per gallon. Pyridines 90/160 grade 13s. and 90/140 grade 15s. per gallon.

Gas Stocks and Shares

The Gas Market continued to gain strength last week, and although the number of transactions was a trifle below that of the previous week, some sharp upward movements were recorded. The increased final dividend gave a fillip to South Suburban stocks, the ordinary rising 9 points, while Barnet, Bournemouth, and Southampton were also strong features. In the Supplementary List, several parcels of Plymouth and Stonehouse 5% deb. changed hands at par against 84 nearly a year ago and the stock closed 14 points higher.

Among last week's final dividend announcements appeared the following, the year's total being shown in brackets: Derby 4½% (7½%), East Surrey "B" 2½% (5%).

The following price changes took place during the week:

OFFICIAL LIST		
Barnet Ord.	123—128	+6
Bournemouth 7 p.c.	124—129	+6
Cardiff (*x.d.*)	95—100	Feb. 2
Commercial	32—37	+1
Croydon sliding scale	93—98	+1
Imperial Continental	59—64	−1
South Suburban Ord.	70—75	+9
Ditto 5 p.c. Pref.	84—89	+2
Ditto 4 p.c. Pref.	68—73	+3
Southampton Ord.	63—68	+8
Tottenham Ord.	78—83	+1.
United Kingdom Gas Corporation, Ltd.	14/—16/-	+-/6d.
Wandsworth Cons. (*x.d.*)	72—77	Feb. 2
Ditto 4 p.c. Pref. (*x.d.*)	68—73	"
Ditto 4 p.c. Deb.	82—87	+3
SUPPLEMENTARY LIST		
Plymouth & Stonehouse 5 p.c. Deb.	97—102	+14

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FULL particulars of these spaces can be obtained on application to the Publishers. They are designed principally for the use of the firms whose display advertisements cannot be included owing to paper rationing.

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For particulars see "GAS JOURNAL," Dec. 3, 1941, p. 348.

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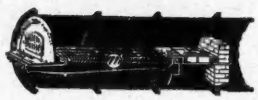

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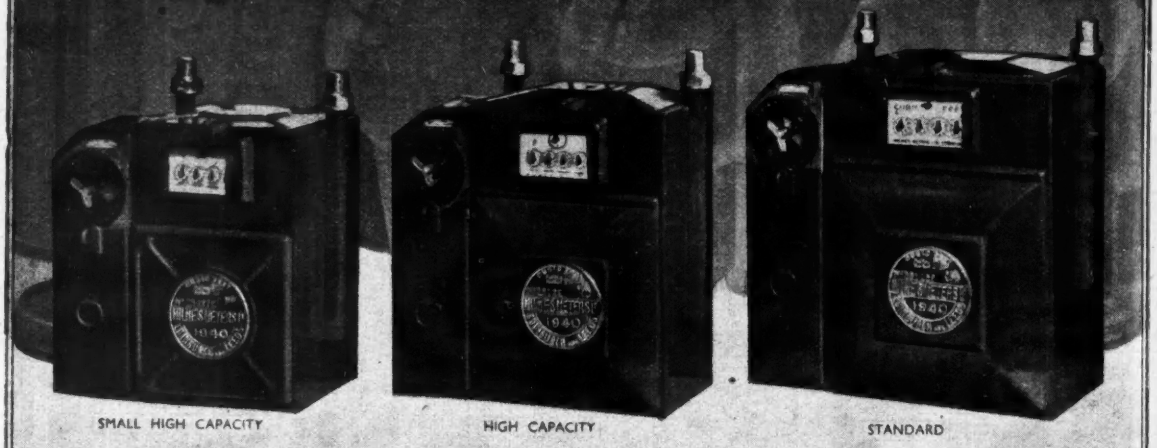

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CONTENTS

EDITORIAL NOTES

Signpost 241
District Views Needed 241
Statistical Starvation 242
The "Time-Talent" Factor 242
Domestic Gas Water Heating 243

Personal 243
National Gas Council 243

Fuel Supplies to Industrial Consumers .. 243
Water Heating by Gas—Further Considerations. By Arthur Forshaw .. 244
The Institution of Gas Engineers .. 245
The Gas Industry Post-War. By H. N. Dann 246
Munitions Factory in the North-West .. 250

Valve Operating Gear for Gasholders .. 250
Synthesis of Toluene 250
Company Meeting 250

Gas Products Prices 255
Gas Stocks and Shares 255

THIS WEEK'S ADVERTISERS

	PAGE
Alder & Mackay, Ltd.	256
Ascot Gas Water Heaters, Ltd.	Cover I
Ashmore, Benson, Pease & Co., Ltd.	233
Bale & Church, Ltd.	257
Blakeley, Firth, Sons & Co., Ltd.	257
Boulton Tubular Structures, Ltd....	226
British Fittings Co. (Hendon), Ltd.	228
British Gas Purifying Materials Co., Ltd.	258
Broadbent, J. C., & Co., Ltd. ...	258
Brotherhood, Peter, Ltd.	239
Cellactite & British Uralite, Ltd. ...	229
Clayton, Son & Co., Ltd....	Cover IV
Cowan, W. & B.	Cover III
Crookston, S., & Co.	257
Dempster, R. & J., Ltd.	225
Dempster, Robert, & Sons, Ltd.	246, 257
Donkin Co., Ltd (The Bryan)	Cover II
Drakes, Ltd.	237

	PAGE
Ellison Insulations, Ltd.	257
Falk Stadelmann & Co., Ltd. ...	226
Fraser & Chalmers Engineering Works	230
Gas Meter Co., Ltd. ...	Cover IV
Gas Purification & Chemical Co., Ltd.	257
Glover, Thos., & Co., Ltd. ...	240
Grant & West, Ltd.	258
Harris & Pearson, Ltd., ...	Cover IV
Harrisons (London), Ltd.... ...	258
Holden & Brooke, Ltd.	227
Holmes, W. C., & Co., Ltd. ...	259
Horden Collieries, Ltd.	227
Humphreys & Glasgow, Ltd. ...	238
Hyde, Silas, Ltd.	227
Jenkins, W. J., & Co., Ltd. ...	231

	PAGE
Keith Blackman, Ltd.	260
King, Walter, Ltd.	257
Kleenoff Co.	228
Laidlaw, R., & Son (Edin.), Ltd ...	260
Le Bas Tube Co., Ltd.	235
Main, R. & A., Ltd.	252
Meltham Silica Firebrick Co., Ltd.	228
Mewburn, Ellis & Co.	257
Parkinson Stove Co., Ltd. ...	249
Parkinson, W., & Co.	240
Peebles & Co., Ltd.	230
Pegson, Ltd.	Cover II
Radiation, Ltd.	252, 253
Reavell & Co., Ltd.	232
Saunders Valve Co., Ltd.	255
Spencer (Melksham), Ltd.... ...	236
Strachan & Henshaw, Ltd. ...	258

	PAGE
Trotter, Haines & Corbett, Ltd. ...	258
Visco Engineering Co., Ltd. ...	256
Wakelin, F. H., Ltd.	257
Walker, C. & W., Ltd.	236
Willey & Co., Ltd.	234
Woodall-Duckham Co., Ltd. ...	245
Wright, Alex., & Co., Ltd. ...	257
Trade Cards	255
Appointments Vacant	258
Patents	257
Plant, &c.	257
Plant, &c., For Sale and Wanted	258
Publications	257

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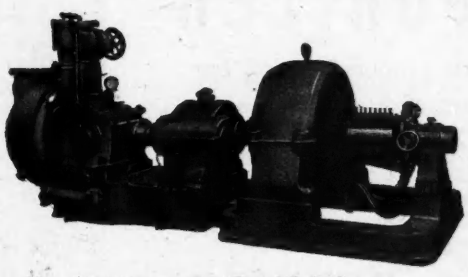

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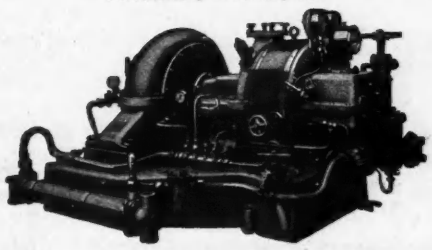

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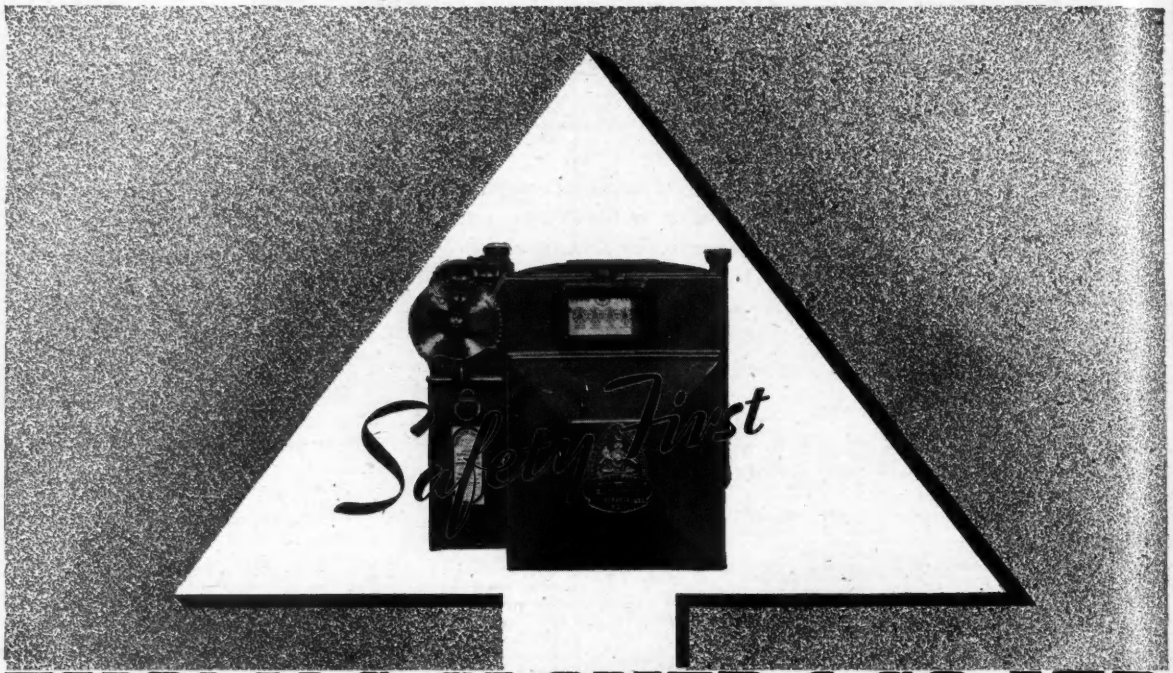

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